

Cover Page

Project title: DWSD Reduction of Lead in Service Lines within the City of Detroit, Michigan

National Priority Area: Priority Area 1: Reduction of Lead Exposure in the Nation's Drinking Water Systems through Infrastructure and Treatment Improvements

Name of applicant: Detroit Water and Sewerage Department

Key personnel and contact information:

Samuel Smalley, P.E.

Samuel.Smalley@detroitmi.gov,

Office 313-267-1239,

Mobile 313-410-1099

Total project cost:

	Cost
Federal Funds Requested	\$5,000,000
Total Project Cost:	\$5,000,000

Executive Summary

The Detroit Water and Sewerage Department (DWSD) is applying for a Reduction in Lead Exposure Via Drinking Water, Water Infrastructure Improvements from EPA under National Priority Area One: Reduction of Lead Exposure in the Nation's Drinking Water Systems through Infrastructure and Treatment Improvements. DWSD will use the grant to accelerate the pace of its lead service line replacement (LSLR) program, resulting in primary prevention of lead exposure for Detroit's most vulnerable populations. Through this \$5 million LSLR program, DWSD will be able to replace about 400 lead service lines (LSLs) in Detroit's disadvantaged opportunity zones. DWSD takes a comprehensive approach to addressing lead in drinking water through its Lead Risk Reduction Program by using a combination of corrosion control, public education, filter use, and LSL removal.

DWSD desires to replace all 80,000 estimated LSLs in its service area within 20 years as required by the Michigan LCR. DWSD has been rolling out its LSLR program over the past 4 years, and funding is the biggest barrier to increasing the pace of LSLR in Detroit in light of the impacts of Covid-19. The priority opportunity zones identified for this project have a high number of LSLs and a large population of children 5 years and under. Accelerating LSLR in each of these neighborhoods will provide lifelong benefits of reduced lead exposure for large populations of Detroit's youngest residents.

DWSD has created a comprehensive public outreach campaign to educate customers and community leaders about the risks of lead in drinking water. This program provides extensive, consistent education on the risks of lead in drinking water and will provide interventions for the city's most vulnerable residents over the duration of DWSD's LSLR program. DWSD developed this program voluntarily as a matter of public health protection, targeting residents served by LSLs, informing residents of the LSL removal process, and providing ongoing education and filters to residents during construction. This complete public outreach effort will enable DWSD to maximize the number of lead services replaced as part of this grant-funded project. DWSD has also openly shared its public outreach materials with other community water supplies in the southeast Michigan region to increase lead risk mitigation efforts beyond Detroit's borders.

DWSD's Lead Risk Reduction Program produces environmental results; specifically, the program provides a safer and healthier environment through its LSL removing water infrastructure improvement program. By removing LSLs and implementing a thorough public education and outreach program, DWSD is reducing lead exposure in the city of Detroit as it provides safer drinking water over the long-term for disadvantaged communities in Detroit. DWSD has a robust monitoring system for tracking progress toward these important goals.

DWSD has a highly qualified and experienced team that is ready to launch its accelerated LSLR program as soon as the grant is awarded. All the programmatic components are in place and the bid documents are ready to go. DWSD looks forward to protecting Detroit's most

vulnerable residents and improving the safety of drinking water through this important program.

Workplan

Introduction and National Priority Area

The Detroit Water and Sewerage Department (DWSD) is one of the largest water and sewer utilities in the United States, serving more than 235,000 accounts, including a residential population of nearly 700,000. We have by far the largest number of lead services among Michigan communities, estimated at around 80,000. DWSD supplies water to a residential population where 33 percent of citizens live below the U.S. federal poverty line, more than twice the average Michigan poverty rate of 14 percent.¹ DWSD knows that with its old housing stock and low-income population, there is a large population that is particularly vulnerable to lead exposure in drinking water, as well as other household sources. Lead is a potent irreversible neurotoxin with no safe level of exposure. DWSD has designed an aggressive Lead Risk Reduction Program taking a proactive approach to eliminate water as an ongoing source of lead exposure in Detroit to the extent possible.

In the months immediately following the initial revelations of the Flint Water Crisis, DWSD began to assess the risk of lead in drinking water in its service area, and to develop strategies to minimize the risks of lead in drinking water. DWSD decided to conduct Lead and Copper Rule (LCR) compliance sampling in 2016, one year before required; enhanced public communications on lead in drinking water risks; reviewed water main replacement procedures; and examined operations and maintenance activities that could increase lead exposure risks. DWSD now replaces lead service lines (LSLs) from the water main in the street to the water meter inside the house every time they are encountered on a water main replacement or rehabilitation project. DWSD distributes ANSI/NSF 53 certified pitcher filters and household plumbing flushing instructions for service line replacements and repairs and meter replacements on lead services. DWSD also ensures contractors and staff are trained on new standard operating procedures, and we monitor LSL replacement performance. DWSD is considering the needs of Detroit's most vulnerable residents while working on these programs, including expecting families, children, and those of low socioeconomic standing. Specifically, DWSD has been coordinating with the Detroit Health Department to offer water sampling at all homes where a child with an elevated blood lead level (EBLL) has been identified.

Removing lead from contact with drinking water is the most permanent solution for reducing exposure to lead in drinking water. LSLs represent the largest source of lead in contact with water.² Even though DWSD's water has been consistently treated with orthophosphate for

¹ Data from the U.S. Census Reporter. <https://censusreporter.org/profiles/16000US2622000-detroit-mi/> — accessed March 23, 2020.

² Sandvig, A.; Kwan, P.; Kirmeyer, G.; Maynard, B.; Mast, D.; Trussell, R. R.; Trussell, S.; Cantor, A. F.; Prescott, A. Contribution of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues; Research Report 91229; American Water Works Association Research Foundation: Denver, CO, 2008.

corrosion control since 1996, research has shown that corrosion control is very sensitive to pipe and water quality conditions and may not be as reliable during pipe disturbances, long periods with low water use, and galvanic corrosion conditions.³ As DWSD continues to manage these risks, DWSD is working to remove LSLs from the system to minimize those risks in the future.

DWSD is applying for a Reduction in Lead Exposure Via Drinking Water, Water Infrastructure Improvements for the Nation Act Grant from EPA under National Priority Area One: Reduction of Lead Exposure in the Nation's Drinking Water Systems through Infrastructure and Treatment Improvements. DWSD will use the grant to accelerate the pace of its LSLR program, resulting in primary prevention of lead exposure for Detroit's most vulnerable populations. Through this \$5 million LSLR program, DWSD anticipates replacing about 400 LSLs exclusively within Detroit's disadvantaged Opportunity Zones. DWSD takes a comprehensive approach to addressing lead in drinking water through its Lead Risk Reduction Program by using a combination of corrosion control, public education, filter use, flushing, and LSL removal.

The Michigan LCR includes a requirement to replace all of the estimated 80,000 LSLs in the City of Detroit within the next 20 years. As part of its LSLR program, and as required by the Michigan LCR, DWSD is developing a comprehensive service line inventory to document the material of every service line in the system. DWSD always notifies the resident and owner of a home every time an LSL is identified in the field, and DWSD notifies all new account owners if their home is served by an LSL. As previously described, DWSD has been rolling out its LSL replacement (LSLR) program over the past 3 years, and funding is the biggest barrier to increasing the pace of LSLR in Detroit.

Detroit declared bankruptcy on July 18, 2013, carrying a then estimated debt load between \$18-\$20 billion, resulting in the largest municipal bankruptcy filing in U.S. history. Since that time, however, there has been significant progress in Detroit, including successfully emerging from bankruptcy in just 13 months, establishing partnerships between city and state leaders, regularly engaging with the philanthropic community, and has seen significant private investment, especially in the downtown and other redeveloping areas on the periphery.

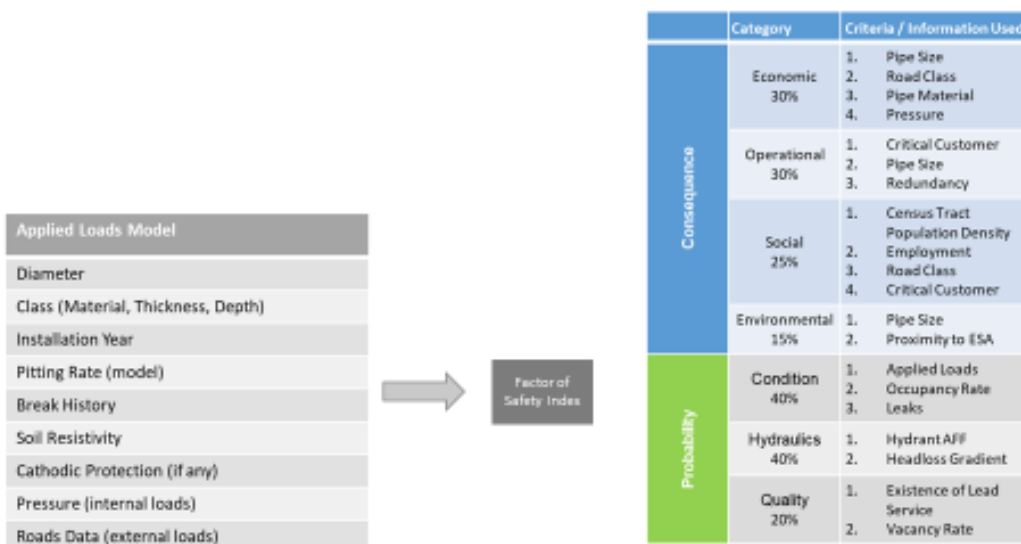
This progress has been made possible in part through the city of Detroit's renewed emphasis on detailed analysis and asset management planning needed to ensure prudent investments are made on its infrastructure. As part of this asset management planning structure shown below, DWSD's work to date has focused on replacing LSLs through its Asset Management and Capital Improvement Program (CIP), with some unplanned or emergency LSL replacements being performed in instances of elevated blood lead levels or loss of service complaints.

³ United States Environmental Protection Agency. *Optimal Corrosion Control Treatment Evaluation Technical Recommendations for Primacy Agencies and Public Water Systems*. EPA 816-B-16-003, 2016, www.epa.gov/sites/production/files/2016-03/documents/occtmarch2016.pdf.

Asset Risk & Prioritization Framework - Water



$$\text{Consequence} \times \text{Probability of Failure} = \text{Asset Risk}$$



detroitmi.gov/dwswd

DWSD plans to continue and expand the scope of the LSLR program through this grant to begin a proactive LSL Replacement Program that is independent from and in addition to the CIP LSLR program. This program will focus exclusively on Opportunity Zone neighborhoods with a high concentration of LSLs and low-income populations to maximize the reduction of lead exposure for the most vulnerable residents of Detroit. DWSD has been building the programmatic foundation for this comprehensive LSLR program, but needs a source of external funding to implement the complete scope of the program. The program proposed in this application will replace about 400 full LSLs in disadvantaged neighborhoods.

However, the onset of the COVID-19 pandemic continues to significantly disrupt DWSD's revenues and as such, adjustments to expenses including capital replacements projects are likely. Over the last several months, Detroit has regularly been identified as a national hot spot for the pandemic, hitting the city disproportionately hard both in terms of the number of cases and deaths.



10,394
Cases

1,263
Deaths

While we are developing recovery plans and analyzing what levels of capital project expense adjustments are needed, the need to continuing making progress on removing lead risk from our customers, especially those most vulnerable in Opportunity Zones, remains a priority. The full impact of the pandemic has not yet been realized, and our team is working on the plans, but we have recorded a significant drop in revenues over the first few months of this pandemic.



DWSD's Approach for Addressing the Required Project Elements for LSLR Programs Under National Priority Area 1

EPA's grant program includes all required project elements for LSLR projects. DWSD has accounted for each of these elements as follows:

DWSD Has Considered Corrosion Control Treatment

DWSD, along with about 100 additional municipal water systems in Southeast Michigan, gets treated water from the Great Lakes Water Authority (GLWA). Detroit water has been treated with orthophosphate for corrosion control since 1996. In late 2019, GLWA awarded a contract for a new corrosion control optimization study to cover the entire GLWA service area, including Detroit, and the study will be ongoing for at least the few years. DWSD recognizes that

corrosion control is critical for controlling and reducing lead release, both while individual homes served by LSLs wait for their turn for replacement, and after all LSLs are replaced because smaller sources of lead will remain in household plumbing. DWSD personnel are actively participating in the GLWA Corrosion Control Project, and providing sampling locations within the city to help further this project's benefits.

DWSD has developed and continues to improve its Innovyze Infowater all pipe hydraulic model of the water distribution system. Through assessing demands on the system via our Automated Meter Reading system, we are able to analyze various attributes of our system including flows, pressures, and age of water. The age of water is relevant to corrosion control as excessive detention times can lead to the protective orthophosphate precipitating out of the supply. DWSD's hydraulic model will continue to inform our corrosion treatment and corrosion control strategies.

DWSD Ensures That Both the Publicly Owned and Privately Owned Portions of LSL Will Be Replaced and That No Section of LSL Remains in Place

Per DWSD's policies adopted in 2018 and reiterated through the Michigan LCR, DWSD always replaces full LSLs, from the water main in the street to the meter inside the customer's home, at DWSD expense. DWSD firmly believes that a resident's access to a full LSLR should not be dependent on their ability to pay. As permitted by the Michigan LCR, there are rare occasions when emergency partial LSLRs are completed due to circumstances beyond DWSD control, but the remaining lead is removed within 30 days of the emergency. DWSD does not leave any section of LSL in place when the full LSLR is complete. NSF 53 filters and flushing instructions are provided each time a lead service line is disturbed by DWSD activities such as meter change outs, water main replacements, and service line replacements or repairs.

DWSD Notifies Customers of Replacement of Publicly Owned Portion of the LSL

DWSD has a comprehensive full LSLR Standard Operating Procedure (SOP) that has been used since 2018 that includes multiple contacts with residents to inform them of pending infrastructure work, how LSLR will proceed in their own home, and an access agreement waiver for them to sign to give permission for the work to be completed. The SOP is attached in the supporting documentation of this application. DWSD does not conduct any work on LSLs without first notifying the customer and obtaining the customer's consent. DWSD is required to notify the resident or owner of a property when a LSL is found to provide water service to a home. In the case of LSLR, work does not begin on the LSLR until the resident has granted written permission for the work to be completed, and DWSD provides a one-year warranty on the completed work.

DWSD Notifies Customers That Privately Owned Portion Must Be Replaced for The Publicly Owned Portion to Be Replaced

All of DWSD's LSLR program materials clearly communicate to residents that DWSD must replace the entire LSL, from water main in the street to the water meter in the house, at the same time. The resident's cooperation for private side replacement is necessary for the LSLR to happen. If the LSLR is

happening as part of a water main replacement project, the home will not get connected to the new water main if the resident does not provide access to replace the private side LSL. So far, this program has achieved 100% compliance with private side LSLR at the same time as DWSD owned LSLR. No customer has refused to participate in our program in large part due to our proactive public outreach program conducted in advance of construction activities.

DWSD Ensures That Customers Are Provided Filters Certified to Remove Lead for Six Months of Normal Consumption, And Provides Flushing Instructions Within 24 Hours of Conclusion Of LSLR

As part of its full LSLR policy, DWSD has been delivering pitcher style filters that meet ANSI/NSF standard 53 for lead reduction plus 3 months' worth of replacement filter cartridges to every home with a LSLR since 2017, providing 6 months of protection. DWSD also delivers AWWA aligned flushing directions that instructs the resident to not use any water inside the house until the flushing instructions have been completed. Per the SOP, a member of the construction crew hands these instructions to the resident prior to turning the water back on. These graphic centric materials, designed to accommodate literacy challenges in Detroit, are all provided in the supporting documentation for this application.

Lead in the Disadvantaged Community

The State of Michigan has four different criteria it uses to determine affordability.⁴ The first criterion is as follows:

"1) More than 50 percent of the geographic area to be served by a proposed project is identified as a poverty area by the U.S. Bureau of the Census. Current poverty areas within Michigan are identified in Appendix B on the Census website." In order to perform a more systematic review, the state demographer has recommended that using the FactFinder poverty table and a family of 3 or 4, in the Poverty Status in the 12 Months for Families column with a percentage above poverty level of more than 20% +/-0% will approximate the 50% of a geographic area.

Detroit meets the Michigan affordability criteria because 33 percent of Detroit citizens live below the U.S. federal poverty line.⁵

Through DWSD's sequential sampling and comprehensive lead risk mitigation efforts over the last three years, we understand that although we have continued to test below the Action Level for lead, the amount of lead exposure in some of our disadvantaged neighborhoods may exceed our test results. We ensure our LCR sampling plan is representative of the system as a whole in alignment with regulatory requirements, but it is likely that there are disadvantaged neighborhoods that require specific attention, which is the emphasis of our Grant application. We also know that there is no safe level of lead exposure and have been working to minimize

⁴ Michigan Department of Environment, Great Lakes, and Energy; Drinking Water State Revolving Fund Intended Use Plan Fiscal Year 2020, p. 15 https://www.michigan.gov/documents/egle/egle-fd-wifs-DWSRF-DWiuppl2020-Final_670368_7.pdf. Accessed April 13, 2020.

⁵ Data from the U.S. Census Reporter. <https://censusreporter.org/profiles/16000US2622000-detroit-mi/> — accessed March 23, 2020.

potential lead impacts across Detroit. Outreach performed under this grant if awarded, will strategically reach deeper into these more disadvantaged neighborhoods.

LSLs in DWSD's Opportunity Zones

DWSD will perform 100% of the LSL replacements funded by this grant in Opportunity Zones.

DWSD has evaluated Opportunity Zones in its service area and identified numerous zones with sufficient numbers of LSLs where DWSD can efficiently and effectively remove LSLs for its most vulnerable residents. Figure 1 shows the DWSD service area, along with the expected number of LSLs in each opportunity zone. Each of the red opportunity zones has more than 1,000 expected LSLs at residential properties that need replacement. DWSD's LSL inventory is primarily based on the initial year of service for each water account. Based on a 1945 change in Detroit's plumbing code that required copper pipe, DWSD assumes that service lines installed prior to 1946 are made of lead. DWSD's Preliminary Distribution System Materials Inventory that was submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) under the revised Michigan LCR is attached in the supporting documentation for this application.

DWSD estimates that there are 80,000 LSLs serving Detroit customers. However, DWSD records indicate that the actual number of LSLs could fluctuate, adding or subtracting as many as 30,000 LSLs. DWSD is continually updating its LSL inventory daily with GIS collector application entries every time a service line material type is observed on meter appointments and water line work.

Looking specifically at this project, DWSD service line inspections performed over the past 4 years in the identified Opportunity Zones show that LSLs are confirmed over 93% of the time. These estimates take into consideration planned water main replacements under DWSD's Capital Improvements Program (CIP); LSL replacements that will occur under the CIP were not counted for this figure. Figure 1 shows that DWSD will have no problem finding and replacing 400 LSLs with this grant.

In addition to a high number of LSLs, many of the identified opportunity zones are home to Detroit's population most vulnerable to lead exposure – children 5 and under. Each of the opportunity zones in bold outline have over 200 young children. Accelerating LSLR in each of these neighborhoods will provide lifelong benefits of reduced lead exposure for large populations of Detroit's youngest residents. The overlap of young children and the large number of LSLs make these Opportunity Zones priority locations for replacing LSLs.

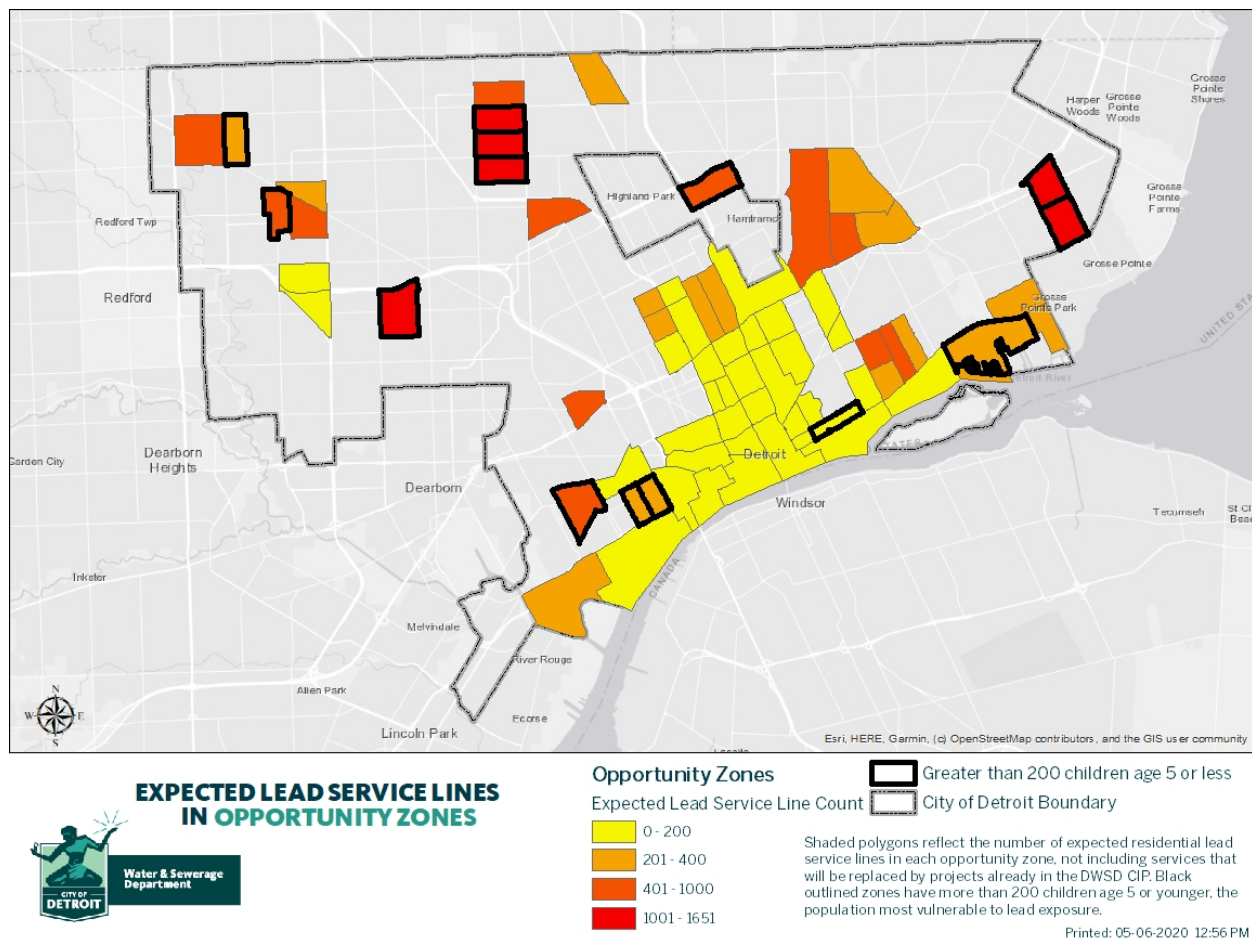
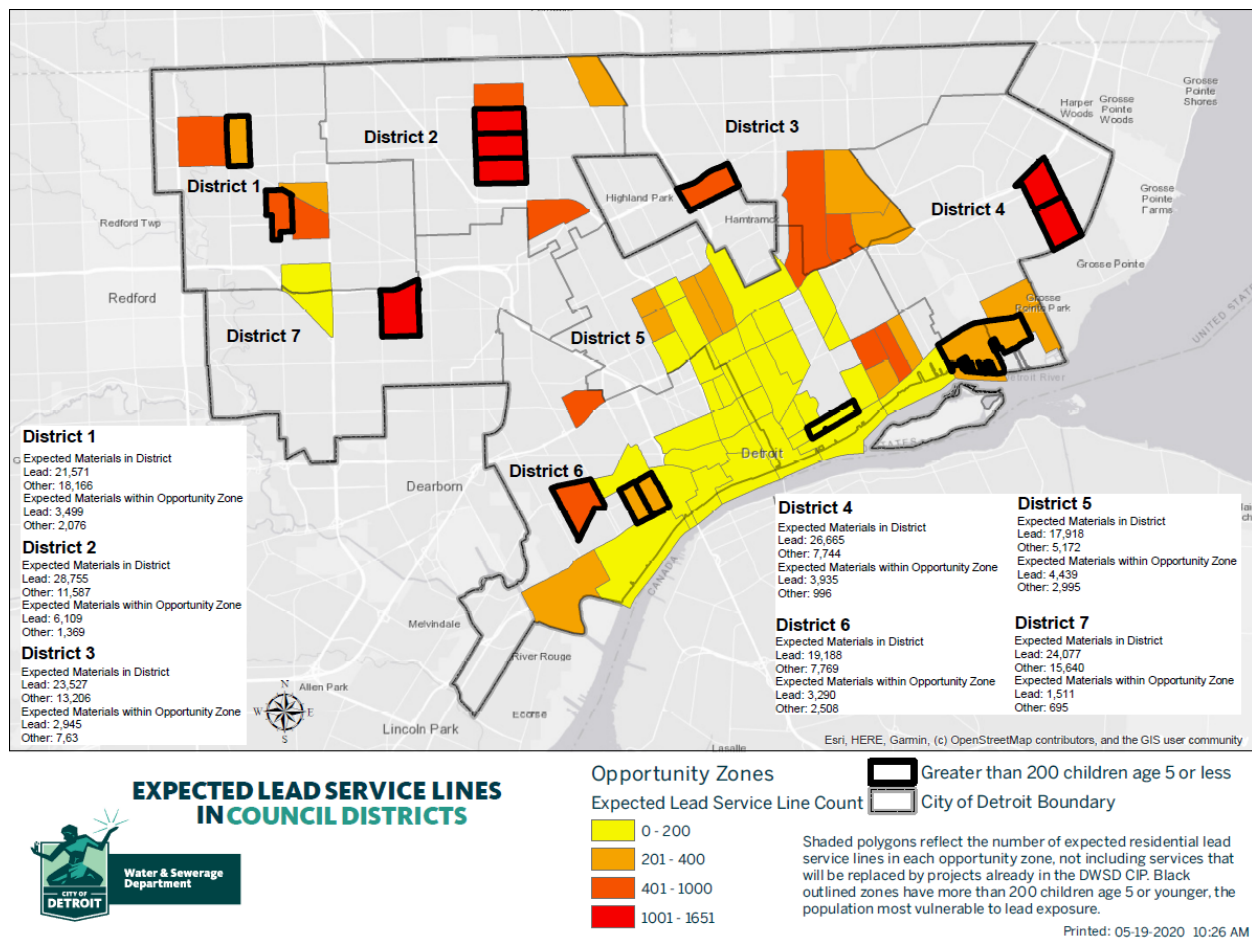


Figure 1: Expected Number of LSLs in DWSD Opportunity Zones



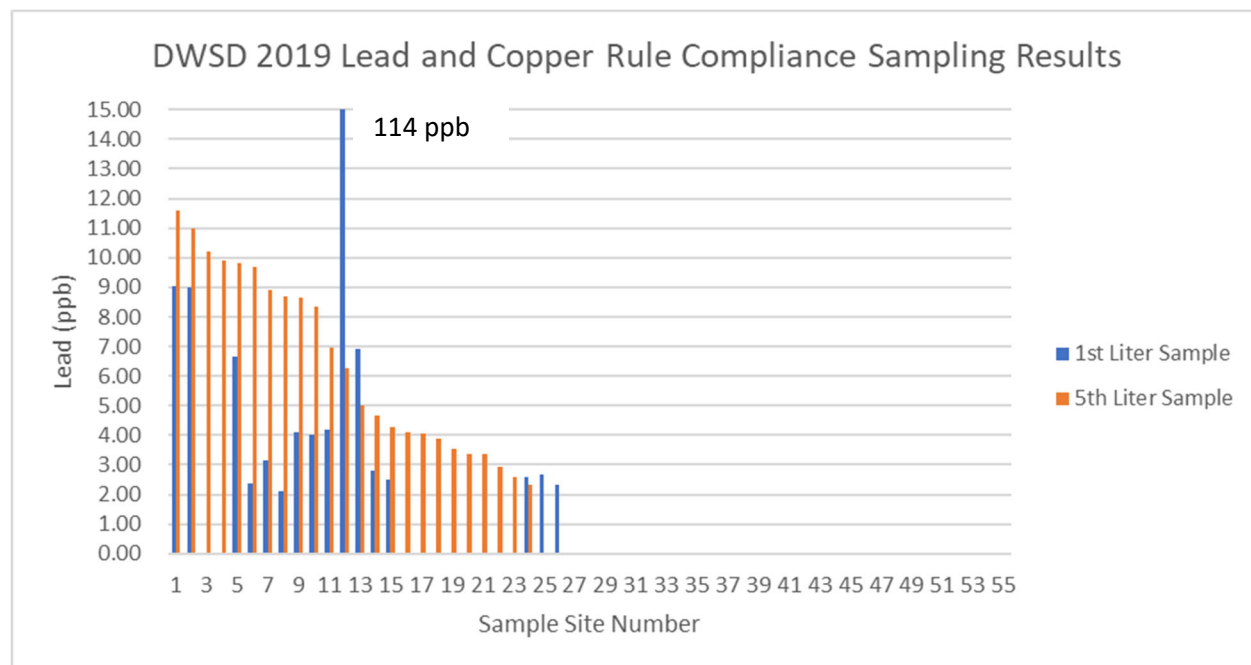
(Which map is better?)

Figure 1 clearly shows that DWSD has well more than 400 LSLs in the targeted opportunity zones that a \$5 million grant awarded under this application would pay to replace. DWSD is capable of replacing many more LSLs if EPA should select DWSD as a grantee and add to the size of the award and DWSD will still stay within the stipulated time frame for grant completion. Our approach is scalable and we have the experience and processes in place to increase our activity level to match any available funding. This is evident in the most recent bidding of a lead service line dedicated projects where the price per service line has significantly increased across the state of Michigan.

DWSD has not had a lead action level exceedance, but DWSD is committed to reducing lead exposure in the city with the highest lead poisoning rate in the state of Michigan.⁶ In 2019 DWSD started collecting first and fifth liter water samples under new requirements of the

⁶Michigan Department of Health and Human Services, 2018 Provisional Annual Report on Childhood Lead Testing and Elevated Levels: Michigan.
https://www.michigan.gov/documents/lead/2020.02.24_CLPPP_2018_Provisional_Report_Published_681911_7.pd. Accessed May 5, 2020.

Michigan LCR; the fifth liter sample is more likely to represent water collected from LSLs. The new data show that, although a single sample with particulate lead highly influences the first liter sample statistics, the fifth liter data show more samples with detectable lead from LSLs. This new data set indicates there is likely more lead in the drinking water at homes with LSLs than indicated by historical LCR sample results. DWSD is committed to reducing this lead exposure risk because the Maximum Contaminant Level Goal (MCLG) for lead in water is 0 ppb.



The COVID-19 pandemic has also reinforced the need to address water quality issues in especially disadvantaged neighborhoods. Detroit was identified as a national COVID-19 hotspot during the White House daily briefings, prompting Michigan’s Governor to issue a number of executive orders. Based on Governor Whitmer’s Executive Order 2020-28, Michigan community water supplies had to turn on water service to all occupied homes. In response, DWSD restored water service to nearly 400 occupied homes. This effort continues today.

During this time, DWSD found a wide variety of private infrastructure related issues in the affected homes that needed water restored. Many residences had seriously deficient plumbing issues that will continue to cause significant water quality concerns. If awarded this Grant, DWSD will prioritize its efforts not only within the identified opportunity zones, but also in addressing ancillary water quality issues associated with improper household plumbing in areas immediately adjacent to the water meter assembly area. DWSD includes a provisional allowance in its contracts to go beyond the immediate meter assembly area to address clearly deficient plumbing issues within easy access of the installer in the customer’s house.

Public Education, Outreach, and Post-Implementation Monitoring

LSLs present an ongoing risk of lead exposure in the home, even when corrosion control is used

and optimized at the water treatment plant. According to the Centers for Disease Control and Prevention, there is no safe level of lead in children and the most important intervention is to prevent lead exposure before it occurs.⁷ Because it may still take at least 20 years to replace all DWSD's LSLs, DWSD has created a comprehensive public outreach campaign to educate customers and community leaders about the risks of lead in drinking water. This program provides extensive, consistent education on the risks of lead in drinking water and will provide interventions for the city's most vulnerable residents over the duration of DWSD's LSLR program. DWSD developed this program voluntarily as a matter of public health protection, targeting residents served by LSLs, informing residents of the LSL removal process, and providing ongoing education and filters to residents during construction. Our outreach materials are available in multiple languages, and rely heavily on graphics to reach those with literacy challenges.



Figure 2: DWSD Filter Distribution Program

⁷ Centers for Disease Control and Prevention (CDC). Lead - What Do Parents Need to Know to Protect Their Children? 2019. https://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm.

DWSD's lead public education program includes community education events, information pamphlets, and [educational videos](#) provided through a variety of outreach mechanisms and community groups to target hard-to-reach populations in disadvantaged neighborhoods. The program continues to include regular neighborhood block meetings that were successfully designed and implemented to reach affected communities as part of DWSD's LSLR and water main replacement projects.

Specifically, the lead public education and outreach program includes:

- Informing and educating customers about lead in drinking water,
- Engaging with customers with known, suspected, or possible LSLs to help them understand the risk of lead in water at their home,
- Working with property owners, where applicable, to share information and encourage filter use with tenants and residents, and
- Educating residents on DWSD's LSLR program and how to participate.



Figure 3: DWSD's Public Education Program

DWSD has a sampling program for monitoring lead reductions after LSLR as demonstrated in Figure 4. DWSD is able to use sampling results from this program to measure the reduction of lead in water as a result of LSLR. The ongoing sampling intervals are used to measure lead release that may increase in the short-term as a result of construction but decrease over time as the removed LSL stops contributing lead to the household plumbing.

In the past DWSD has not attempted to collect water samples at all LSLR homes, but at a subset at homes of willing volunteers. As part of this grant program, DWSD will attempt to collect 4 sets of sequential samples (as described in Figure 4) at 10% of the homes with LSLRs.

Quality Assurance/Quality Control

This lead sampling program will use environmental measurements to verify that lead levels in drinking water are reduced as a result of LSL replacement. Because DWSD will be collecting environmental data, DWSD will comply with the Quality Assurance/Quality Control requirements of this grant program. Upon receiving word that DWSD will receive a grant, DWSD will develop a written quality assurance system that complies with EPA's quality policy and submit the quality assurance system for EPA review. After receiving EPA's approval, DWSD will implement the EPA-approved quality assurance system. As part of this process DWSD will prepare a quality assurance project plan and submit it to EPA for approval 45 days before beginning field work under this grant program.

DWSD works with the Great Lakes Water Authority (GLWA) Water Quality Laboratory to complete all of its lead sample analyses. The GLWA laboratory is certified to analyze drinking water samples and uses analytical methods approved by EPA. The GLWA quality assurance system will serve as the foundation of DWSD's Quality Assurance/Quality Control program for this grant. The GLWA laboratory's Lead and Copper Standard Operating Procedures are provided in the supporting documentation for this grant application.

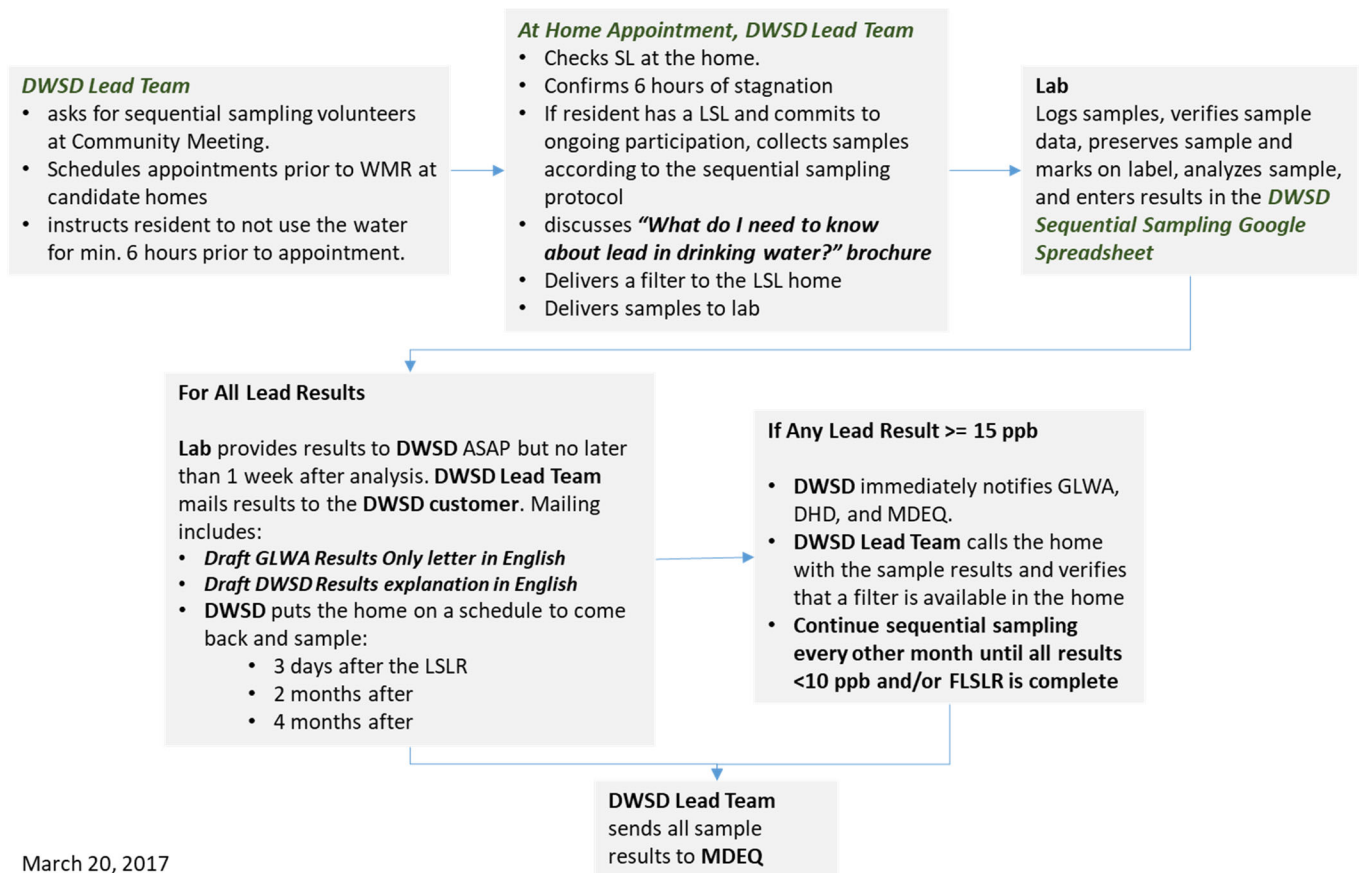


Figure 4: DWSD's LSL Replacement Water Sampling Procedures

Maintaining lead reductions after project completion

DWSD plans to use all of its grant funding for LSLR and associated outreach and education, which permanently removes the largest source of lead in contact with drinking water for Detroit homes. In contrast with other lead reduction strategies, LSLR does not require maintenance once complete because the lead has been removed from the system. Flushing after FLSLR is important to remove lead that may have accumulated in household plumbing from LSLs. DWSD relies upon its ongoing program support components of 1) public education and outreach, 2) post-LSLR sampling, 3) temporary filter use, and 4) corrosion control treatment to ensure household lead reductions are maintained after LSLR.

As noted earlier in this application, DWSD's water is treated with orthophosphate for corrosion control and there is an ongoing corrosion control treatment study to reassess the performance of current treatment. This is important for ongoing lead management during the LSLR process as well as to address smaller sources of lead in household plumbing that can result in ongoing exposure within resident homes.

Expeditious Project Readiness to Proceed

DWSD has been operating its Lead Risk Reduction Program for several years and is more than ready to proceed expeditiously, accelerating the pace of LSLR when it receives this grant. In 2018 when DWSD was awarded a one million dollar Pilot Grant by Michigan Department of Environment, Great Lakes, and Energy, DWSD was able to efficiently and effectively replace 160 LSLs in less than half the time allotted within that grant. This Pilot Grant work also maximized the replacement of lead services, putting the entire grant amount into the replacement of services with DWSD bearing all administrative and overhead costs. Our programmatic approach is expandable and repeatable based on funding allocations.

Since January 2016 when the Great Lakes Water Authority and the Detroit Water and Sewerage Department split, DWSD has regularly availed itself to using low interest Drinking Water Revolving Fund and State Revolving Fund programs. We have included several examples of these projects that have been successfully completed and closed out. These loan funded projects resemble grant funded projects in that allowable expenses are strictly defined, monitored, and audited. Schedules must be adhered to consistent with annual funding cycles, and sufficient documentation is required to satisfy third parties that funds were used on qualifying expenses. DWSD's strong managerial team identified for this project will responsibly manage and thoroughly document all phases of the project in support of all grant requirements and audits.

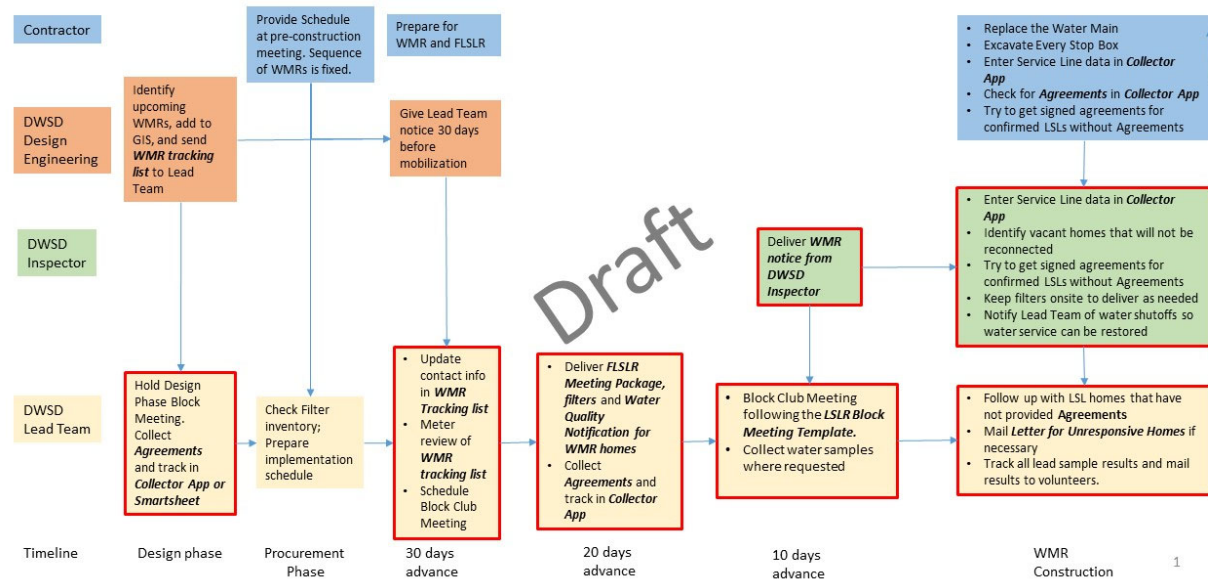
Past and current practices being implemented to reduce exposure to lead in water

As mentioned previously, DWSD began taking proactive steps to address lead in drinking water as the Flint water crisis was unfolding, and implemented a full LSLR policy in 2018 in advance of the Michigan LCR revision. DWSD has been learning from these ongoing programs and improving implementation as time progresses. Figure 5 shows a flow chart that walks through the major steps of DWSD's well established LSLR program for CIP water main replacements. This figure lays out how various DWSD departments interact with each other, the contractor, and the public to implement the program. It also details all the customer outreach activities that are employed to inform residents about LSLs and the practices they should maintain in their homes to maintain water quality during and after construction. DWSD will use the grant to implement a similar LSLR program in Opportunity Zones where there is no ongoing CIP work.

10/30/2018

DWSD Planned FLSLR Program Process Flow Diagram

Represents customer interaction



10/30/2018

DWSD Planned FLSLR Program Process Flow Diagram (cont.)

Represents customer interaction

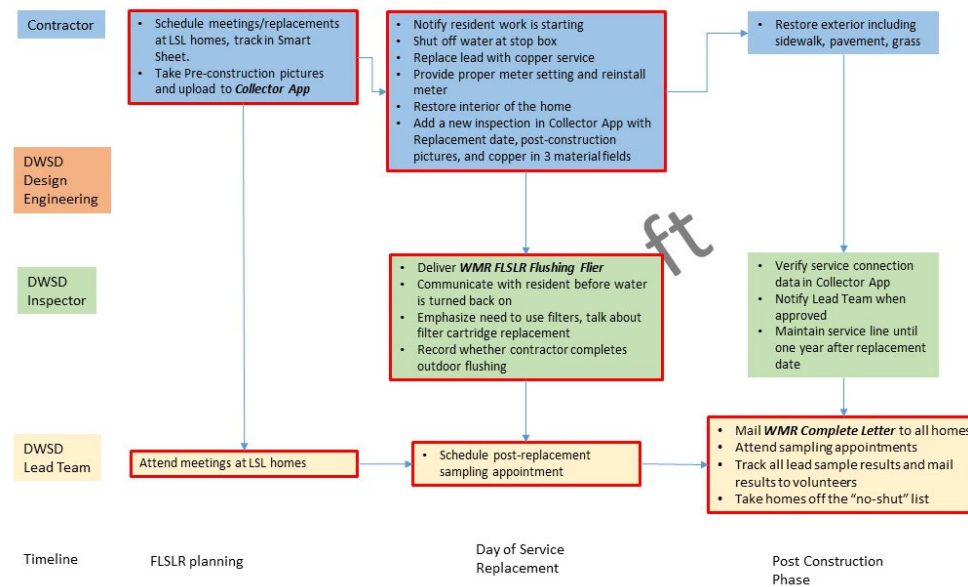


Figure 5: DWSD FLSLR Program Process Flow Diagram

DWSD has completed planning and design, and all permits and approvals, bid documents, construction schedules, legal agreements have been obtained.

Because DWSD has been implementing this Lead Risk Reduction Program for several years, DWSD has the full range of program documents necessary to demonstrate DWSD's experience in this work. These program documents can all be found in the supporting documentation for this application and include:

- SOP for unplanned Full Lead Service Line Replacement,
- Bid Book for the LSLR contract to be awarded with the grant
- LSLR Project Work Schedule
- DWSD Full Lead Service Line Replacement Administrative Order
- Meeting invitations for community outreach meetings,
- Flushing instructions, filter vendor agreements, public outreach materials
- Lead Service Line Replacement agreements, and
- Lead Service Line Replacement complete/notice of warranty letter.

DWSD has successfully implemented and managed the full LSLR program with several different contractors over the past 4 years. DWSD continues to improve the full LSLR program as it learns from ongoing implementation. DWSD has the experience, procedures, and support in place to aggressively pursue its LSLR goals. The only thing DWSD needs is the money to accelerate the program. It is also noteworthy that when any public agency or community water supply asks, we freely provide all of our previous work to advance the lead safety footprint of our region.

Environmental Results and Measuring Progress

Project Objective and Link to EPA Strategic Plan

DWSD's Lead Risk Reduction Program supports EPA Strategic Goal 1: Deliver a cleaner, safer, and healthier environment for all Americans and future generations by carrying out the Agency's core mission, Objective 1.2: Provide for Clean and Safe Water: Ensure waters are clean through improved water infrastructure and, in partnership with states and tribes, sustainably manage programs to support drinking water, aquatic ecosystems, and recreational, economic, and subsistence activities. DWSD's Lead Risk Reduction Program accomplishes this by:

1. Removing LSLs to remove lead from the water system,
2. Sampling after LSL replacement to verify lead reductions,
3. Providing public education and outreach regarding how to reduce risk of lead exposure through drinking water so residents can reduce lead exposure in their own homes,
4. Providing lead reducing filters to homes with LSLs, and
5. Maintaining corrosion control treatment to manage lead in household plumbing.

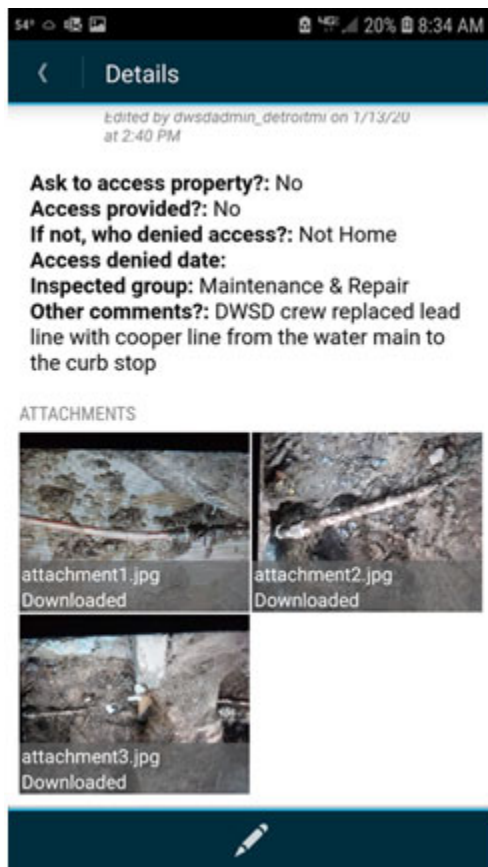
DWSD's Lead Risk Reduction Program provides a safer and healthier environment through its LSL removing water infrastructure improvement program. By removing LSLs and implementing a thorough public education and outreach program, DWSD is reducing lead exposure in the city of Detroit as it provides safer drinking water over the long-term for disadvantaged communities in Detroit. The first three items listed here will be funded by the EPA grant, while the fourth and fifth items are ongoing programs that are part of DWSD's long-term lead risk reduction plan.

Results of Activities

Through this project, DWSD will achieve the following environmental outputs:

1. A reduced number of customers that receive water through a LSL in the DWSD water system due to LSL removal, resulting in a decrease in exposure to lead via drinking water.
2. An increased number of customers with information about lead in drinking water, achieved through outreach and public education on how to reduce risk of exposure to lead in drinking water and how to get LSLs replaced at customer homes.

DWSD has a collector app that tracks DWSD's LSL inventory and LSL replacements. Through DWSD's Lead Risk Reduction Program to date, and as work progresses under this grant, DWSD tracks the number and locations of LSLs removed; the number of homes sampled and number of samples collected; and the number of filters delivered.



DWSD reports its LSLR progress to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on an annual basis, and reports to DWSD customers in the annual consumer confidence report, as required by the Michigan LCR. DWSD will use the collector app to track the specific number and locations of LSLRs that are completed through this grant.

As DWSD communicates with residents during this project, an increased number of customers will have information about lead in drinking water. DWSD will track this work through its public affairs office by tracking the number of community outreach meetings and activities, as well as the number of residents who attend these events or who are contacted through outreach activities (e.g., mailings, phone calls, or social media). This will be in addition to the individuals who are contacted directly for immediate participation in DWSD's LSLR program, where specific properties are tracked in DWSD's collector app.

Projected Environmental Improvement

Through grant, DWSD will achieve the following environmental outcomes:

1. A reduction in lead exposure and associated harms through reduction of LSLs in disadvantaged neighborhoods in the DWSD water system.
2. An increase in public understanding of the health effects of lead in water and the aggressive program DWSD is implementing to prevent lead exposure and remove LSLs from the DWSD water system.

DWSD will use its pre- and post-LSLR lead sampling program to measure the reductions in lead exposure via drinking water at the homes where LSLs are removed. Even though not all homes will be sampled, the samples collected will represent the range of lead in water prior to and following LSLR. At the end of the grant period, DWSD will be able to demonstrate the reduction in lead exposure through a comprehensive analysis of this sampling data.

DWSD will track the number of homes that participate in the LSLR program as a measure of increased public understanding of the health risks of lead in water. The number of contacts per household should decrease over time as outreach improves, and resident follow through with LSL replacements should increase as more residents learn about and participate in DWSD's LSLR program.

Milestone schedule/Detailed Budget

Detailed Budget Narrative

DWSD's Grant budget of \$5 million will provide for the replacement of approximately 400 lead service lines exclusively within Opportunity Zones, ensuring this money helps some of the most disadvantaged population within Detroit. Our approach is to maximize the dollars spent actually replacing lead service lines, as that is the best bang for the buck in protecting public health and safety. DWSD has already developed the public outreach, project management, and

oversight team and materials for this project, supporting our application that puts the money where its most needed – replacing lead services.

DWSD's overhead and administrative costs are 20% of the total project amount, in alignment with expected total project management costs for a project that has extensive outreach and customer touchpoints.

Budget Overview

Item	Amount
Internal Labor	508,381.67
Overhead on Internal Labor	317,738.54
Consultant Support	8,400.00
Construction Contract	4,128,000.00
Total	5,000,000.00

Major Milestones

Start RFP/Bid Preparation	9/9/2022
Advertisement	12/2/2022
Bid Opening	1/6/2023
Board of Water Commissioner Approval	2/15/2023
Start Construction/NTP	4/3/2023
Work Completion	11/1/2025
Contract/Grant Closeout	2/29/2026

While not listed on the above milestone chart, we do recognize and will work with EPA on having an approved QA/QC process in place prior to the start of construction and sampling/testing. We regularly work with the GLWA laboratory that is certified with the state of Michigan.

The DWSD team for this important project has been successfully completing \$10 million capital water projects for the last several years, including those that included DWSRF loans that require a higher level of documentation and audit. Our proposed schedule is easily achievable and if DWSD is awarded this grant, we are confident that we will finish within the stipulated time frame. Our team can handle additional LSL replacements if additional funding presents itself – our approach has already been vetted in the field, our customers are ready and willing, and our team is anxious to get to work on improving the water quality at our customer's taps.

Programmatic Capability/Experience

Organizational Experience

As described throughout this application, DWSD has been implementing its Lead Risk Reduction Program for several years. Figure 6 shows an organizational chart of DWSD staff that will implement the LSLR program described in this application. This team has successfully

completed capital projects in excess of \$10 million on the water side, many of which included DWRP dollars and increased audit and documentation requirements.

While our projects are publicly advertised and competitively bid, we are fortunate to have a number of very experienced and stable contractors in the Detroit market who regularly bid on our water improvement projects. We view our contractors as an integral part of our project team and they have contributed to our repetitive successful project history.

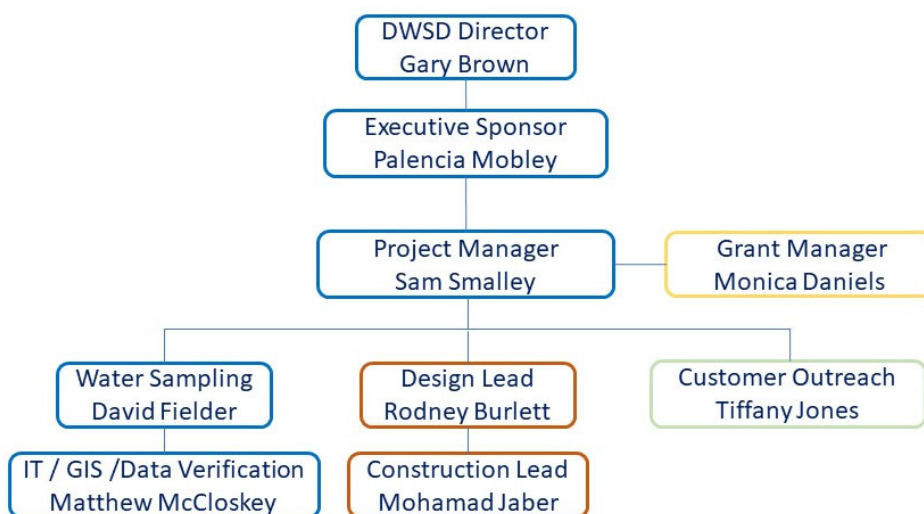


Figure 6: DWSD Reduction in Lead Exposure via Drinking Water Project Team

Staff Expertise/Qualifications

The core team of Sam Smalley, Monica Daniels, David Fielder, Rodney Burlett, Mohamad Jaber, and Tiffany Jones have been working together on DWSD's LSLR program for years, including work on the pilot LSLR grant project described below. Each of these staff members are well versed in capital project delivery and execution. They each bring expertise in their own technical specialties to the team and have honed their skills over the development of DWSD's Lead Risk Reduction Program. Biographical sketches of all staff identified in Figure 6 are provided as an attachment at the end of this application.

As DWSD has already advanced its lead service line replacement approach, our intent is to put as much of the grant funding "into the street", meaning replacing as many lead service lines as possible. Our anticipated number of internal staff hours to design, inspect, manage, outreach, and administer the grant in accordance with grant requirements is approximately 22,630 hours over a four-year period. This equates to 2.72 FTE's per year on average over the four-year period.

Our identified Project Manager, Mr. Smalley, has successfully managed capital projects as large as \$760 million, and has led engineering teams to deliver capital programs delivering \$150 million on an annual basis. Monica Daniels as our Grant Manager, has Single Audit experience and has been responsible for successfully closing all of our recent SRF/DWSRF funded projects, as well as a \$1 million EGLE Pilot Grant project. Mr. Smalley and Ms. Daniels will lead a solid team of experienced members under the Executive Sponsorship of Ms. Palencia Mobley. As Executive Sponsor, Ms. Mobley will ensure the team has all the resources necessary to successfully complete the project, that the project remains aligned with the Grant goals and achieves the prerequisite outcomes.

Past Performance

In 2018, DWSD applied for and received \$1 million dollars from the Michigan Department of Environment, Great Lakes and Energy to serve as a Pilot Project to replace LSLs. Using this funding, DWSD replaced 164 LSLs to understand, improve, and refine our processes.

DWSD was able to fully utilize the Pilot Grant well within the stipulated time frame, and DWSD could have easily doubled the number of services replaced if additional funding was available.

Since 2016 when DWSD split with the Great Lakes Water Authority, we have not performed any federally funded projects. Prior to 2016, DWSD successfully completed a number of Clean Water Projects with Federal Assistance in the implementation of its Long Term Combined Sewer Overflow requirements.

DWSD has regularly relied upon DWSRF and SRF low interest loans since 2016, and we have consistently successfully completed those projects within the stipulated time frames. The typical size of a DWSD Water Capital Improvement project is normally in the \$10M dollar range, so we are very comfortable successfully completing projects of this size within even shorter time frames. We have included in our attachments letters of successful closeout for some of these DWRF projects, as well as the \$1M Pilot Project funded via grant by Michigan EGLE.

Summary

DWSD has a highly qualified and experienced team that is ready to launch its accelerated LSLR program as soon as the EPA awards the grant. All the programmatic components are in place and the bid documents are ready to go. DWSD looks forward to protecting Detroit's most vulnerable residents and improving the safety of drinking water through this important program.

We recognize that the intent of this \$8Grant is not to mitigate the impacts of the covid-19 pandemic, but it would provide some much needed relief in helping DWSD continue to make meaningful progress towards getting the lead out of some of our most vulnerable population's drinking water.

Attachments

[QA/QC Documentation: GLWA Lead & Copper SOPs](#)

[DWSD Grant Biographical Sketches](#)

[Supporting documentation demonstrating readiness to proceed](#)

- SOP for unplanned Full Lead Service Line Replacement
- LSLR Project Work Schedule
- DWSD Full Lead Service Line Replacement Administrative Order
- Meeting invitations for community outreach meetings
- Flushing instructions
- Filter vendor agreements
- Lead Service Line Replacement agreements
- Lead Service Line Replacement complete/notice of warranty letter